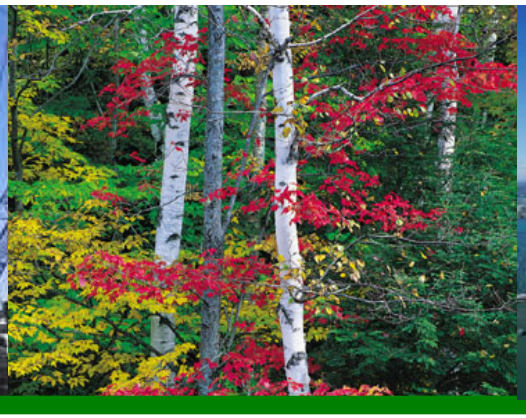





Update on

Cap and Trade Programs for SO_2 and NO_X

Presentation for

Environmental Markets Association

11th Annual Fall Conference

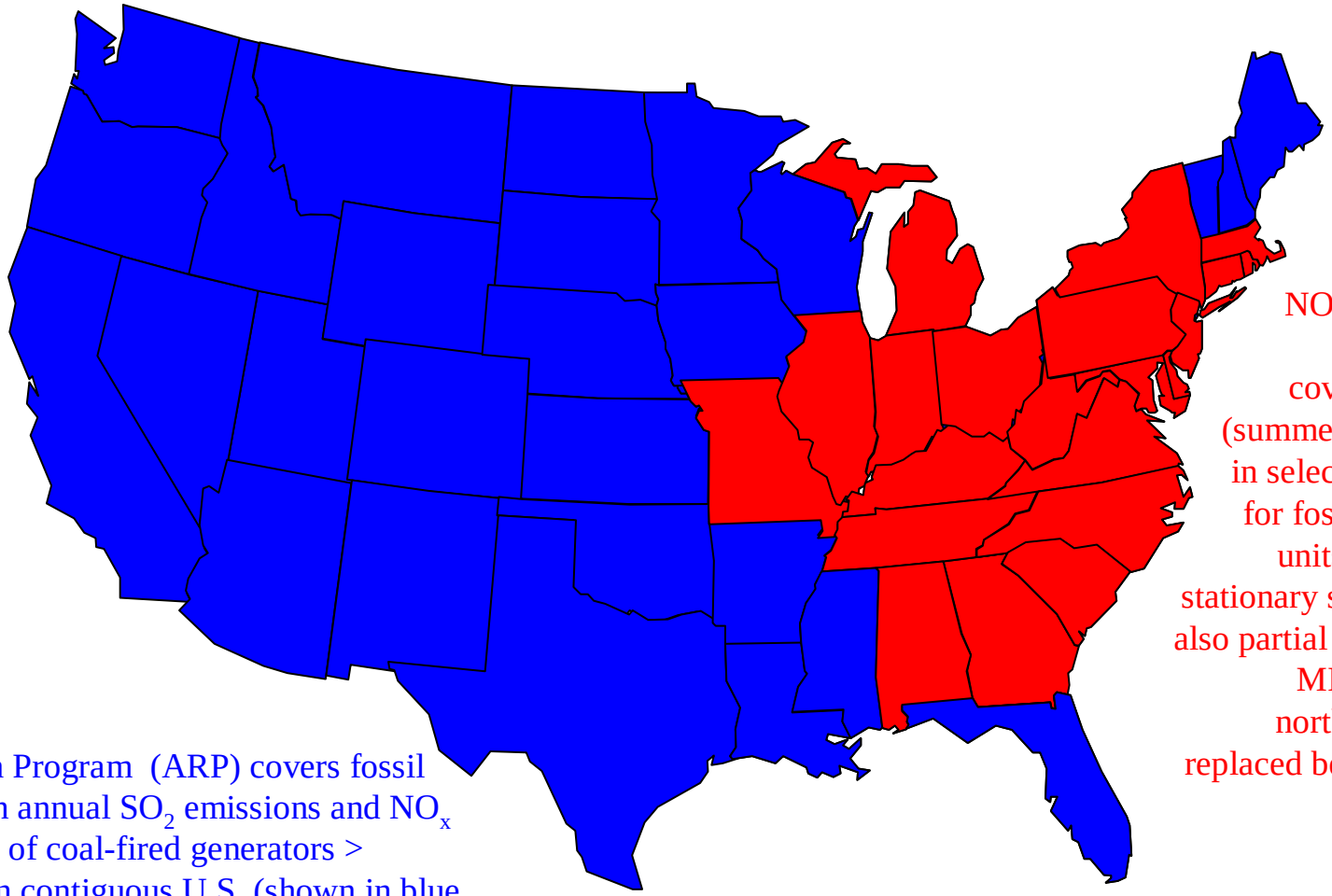
Clean Air Markets Division

U.S. Environmental Protection Agency

Office of Air and Radiation

November 9, 2007

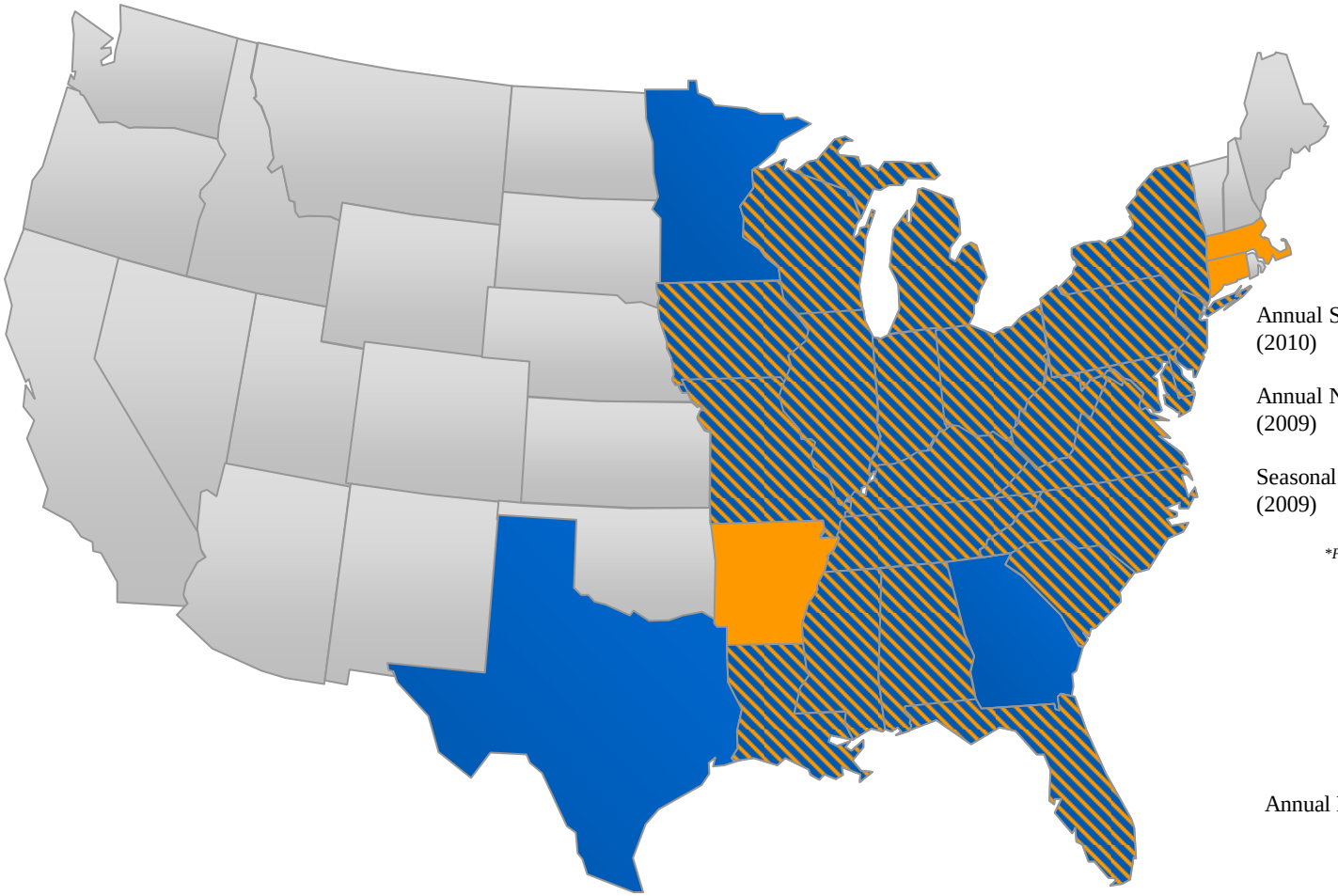
Coverage of ARP and NBP



NO_x Budget Trading Program (NBP) covers ozone season (summer) NO_x emissions in selected eastern states for fossil-fuel generator units (and other large stationary sources). There is also partial coverage of MO, MI, and AL. Earlier northeastern program replaced beginning in 2004.

Acid Rain Program (ARP) covers fossil generation annual SO_2 emissions and NO_x emissions of coal-fired generators > 25MWe in contiguous U.S. (shown in blue and red). Largest SO_2 and NO_x emitters faced control in 1995 and 1996, respectively; all others in program in 2000.

CAIR Sets Stage for CAMR and CAVR



States not covered by CAIR, which are covered by CAVR

States controlled for fine particles (annual SO_2 and NO_x)

States controlled for both fine particles (annual SO_2 and NO_x) and ozone (ozone season NO_x)

States controlled for ozone (ozone season NO_x)

Note: All States are covered by CAMR

CAIR Emission Caps*

(million tons)

	2009/2010	2015
Annual SO_2 (2010)	3.7	2.6
Annual NO_x (2009)	1.5	1.3
Seasonal NO_x (2009)	.58	.48

**For the affected region.*

CAMR Emissions Caps

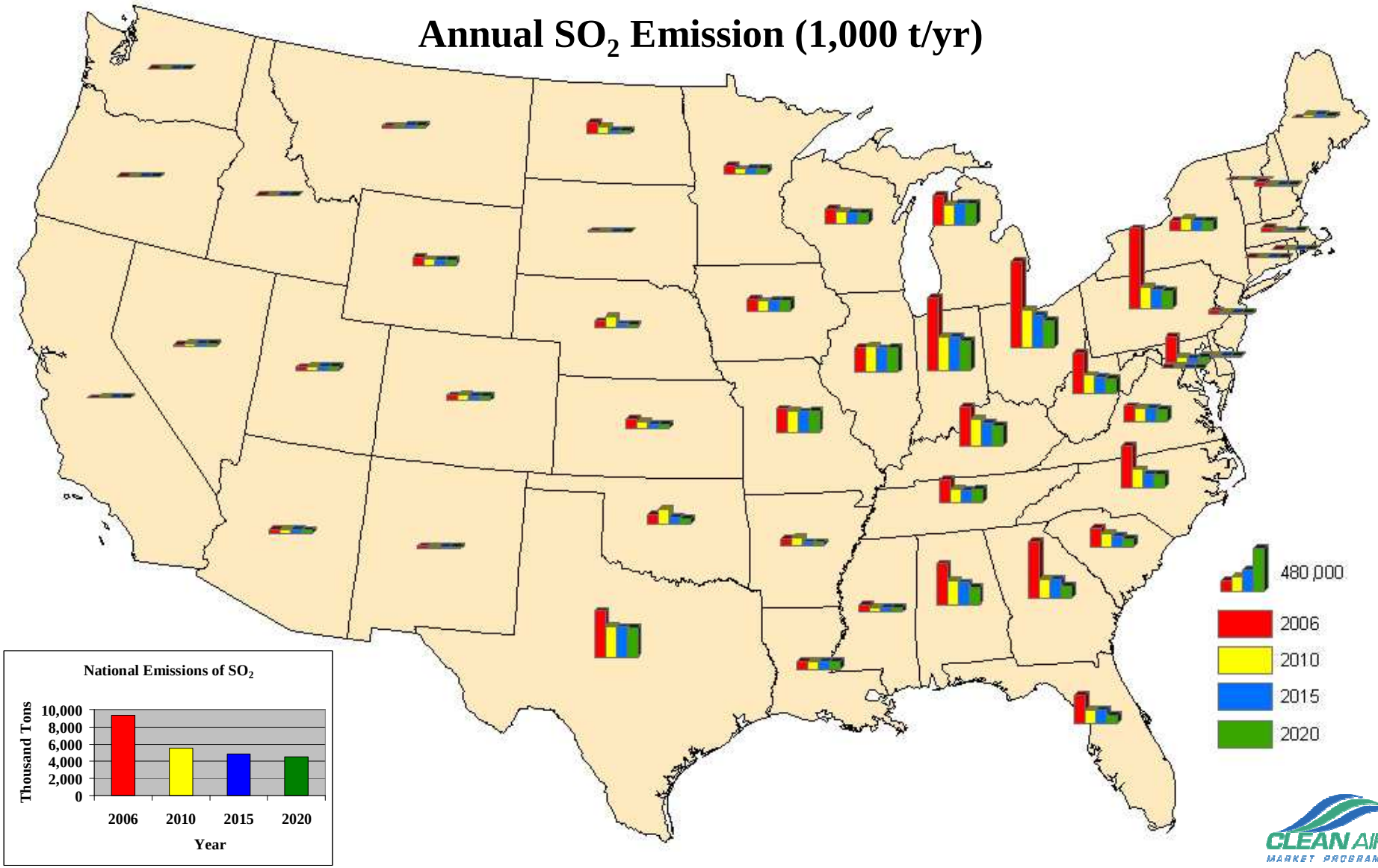
(*tons)*

	2010	2018
Annual Mercury	38	15

CAVR

Outside of CAIR Region – BART

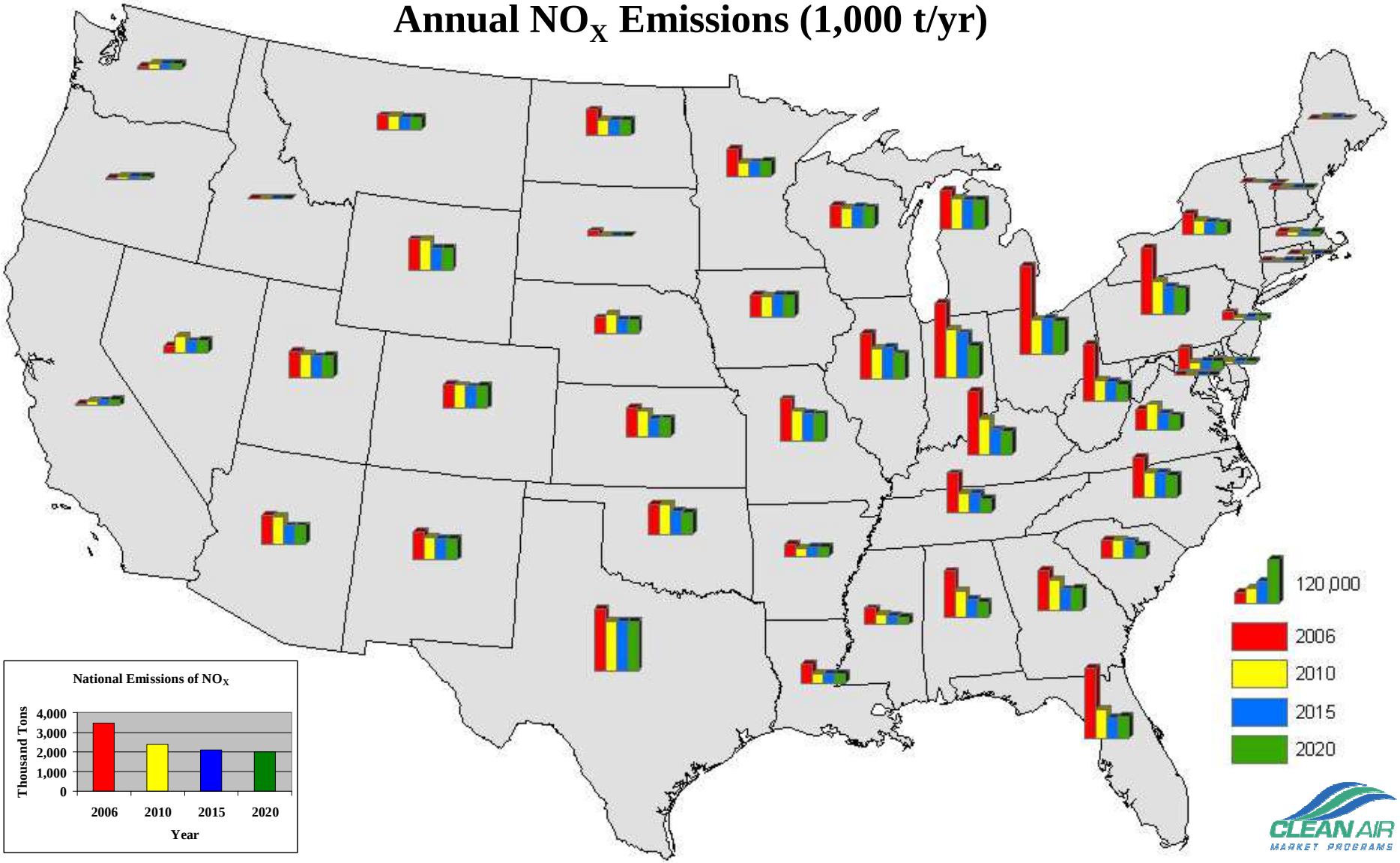
SO_2 Forecast with ARP and CAIR/CAMR/CAVR



CLEAN AIR MARKET PROGRAMS

NO_x Forecast with ARP, NBP, and CAIR/CAMR/CAVR

Annual NO_X Emissions (1,000 t/yr)

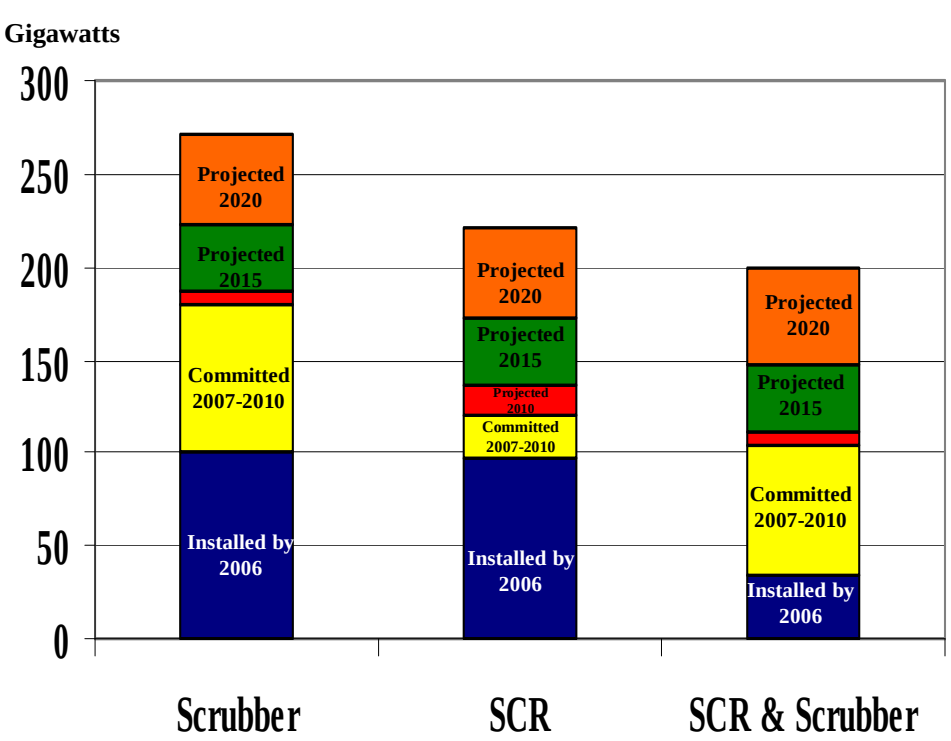


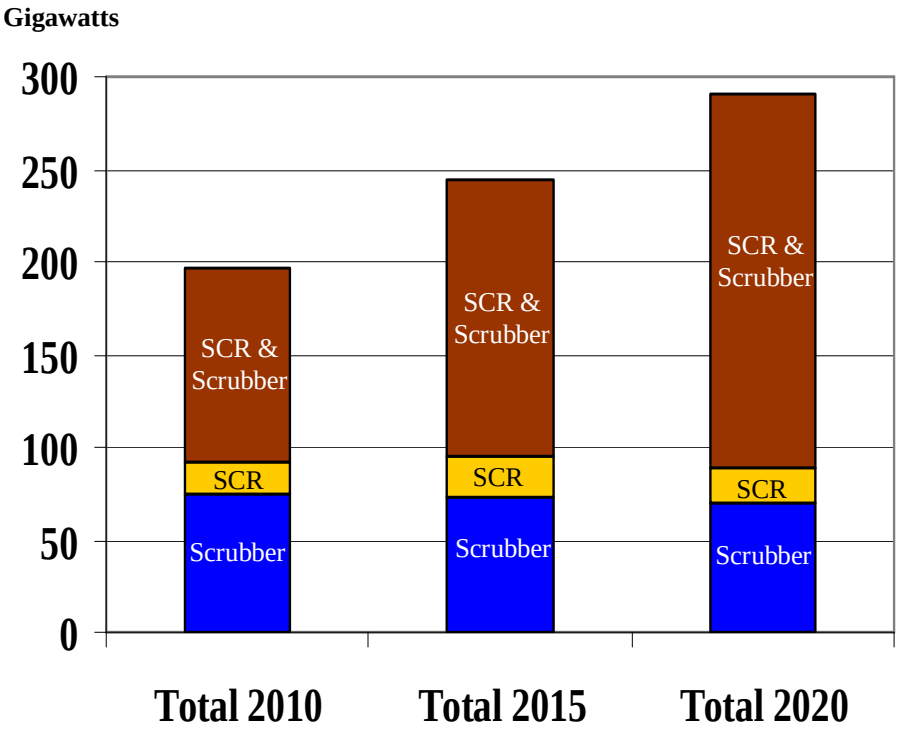
CLEAN AIR MARKET PROGRAMS

Where We Are on Implementation…

- CAIR State Implementation Plans
  - All States plan to utilize trading program
  - EPA is transferring NO_X allowances into facility accounts this Fall
    - Allowances are already in for 3 states (IA, LA, TN)
    - As additional states are approved, allowances will be transferred
    - For a handful of States, EPA anticipates using the Federal Plan allocations (Final CAIR FIP NODA was published on Friday, November 2, 2007)
- CAIR Federal Plan (FP)
  - **FP in effect June 2006**
- Litigation
  - All briefs have been filed for CAIR, CAVR and CAMR
  - Oral arguments are not scheduled for CAIR or CAVR
  - CAMR oral arguments scheduled for December 6, 2007

Advanced Pollution Controls for SO_2 and NO_X that Are Installed, Committed to, and Projected for Coal-fired Generation





The left bar graph provides the amount of coal-fired steam capacity that has either Scrubbers, SCRs, or both technologies in place by 2006 (from EPA's NEEDs database 2007), committed to be operational from 2007-2010 (largely from 2007 survey results), and forecasted by EPA (using IPM) to be operating by the end of 2010, 2015, and 2020, respectively. In 2006, 2010, 2015, and 2020, the total coal-fired capacity is 318 GW, 320 GW, 335 GW and 373 GW, respectively. The right bar graph shows for 2010, 2015, and 2020 the amount of coal-fired steam capacity with Scrubbers, SCRs, or both controls. Both bar graphs included existing and new generation capacity. Virtually all coal-fired generation units have advanced particulate control systems. Some additional units will have SNCR controls and EPA expects virtually all of these units to have NOx combustion controls and the vast majority of the "nonscrubbed" units to use lower sulfur coals.

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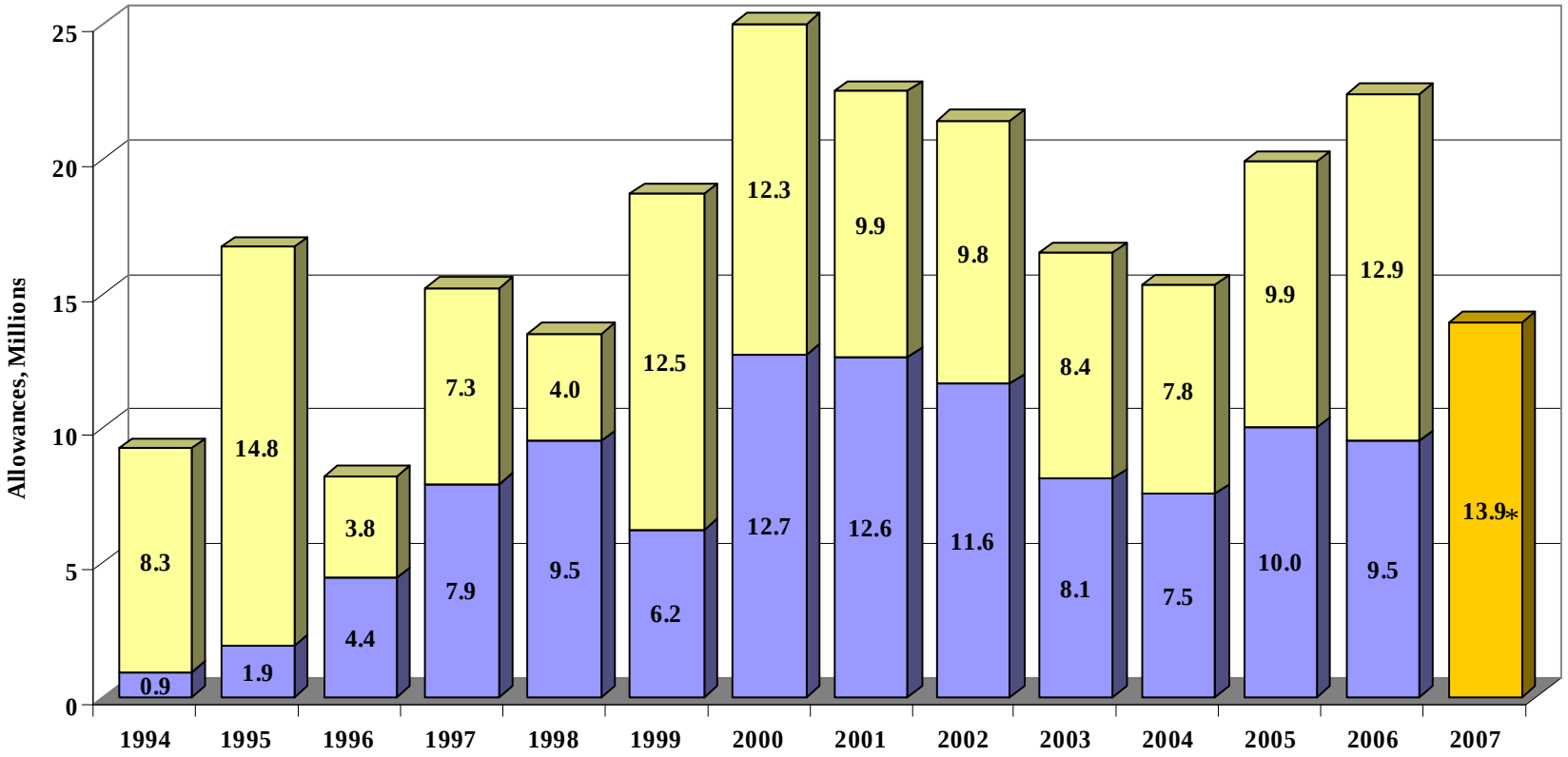
Private SO_2 Allowance Transfers

Market is healthy based on volumes year-to-date – on track to approximate last year's volume.

Breakdown of Private SO_2 Allowance Transfers 1994-2007*

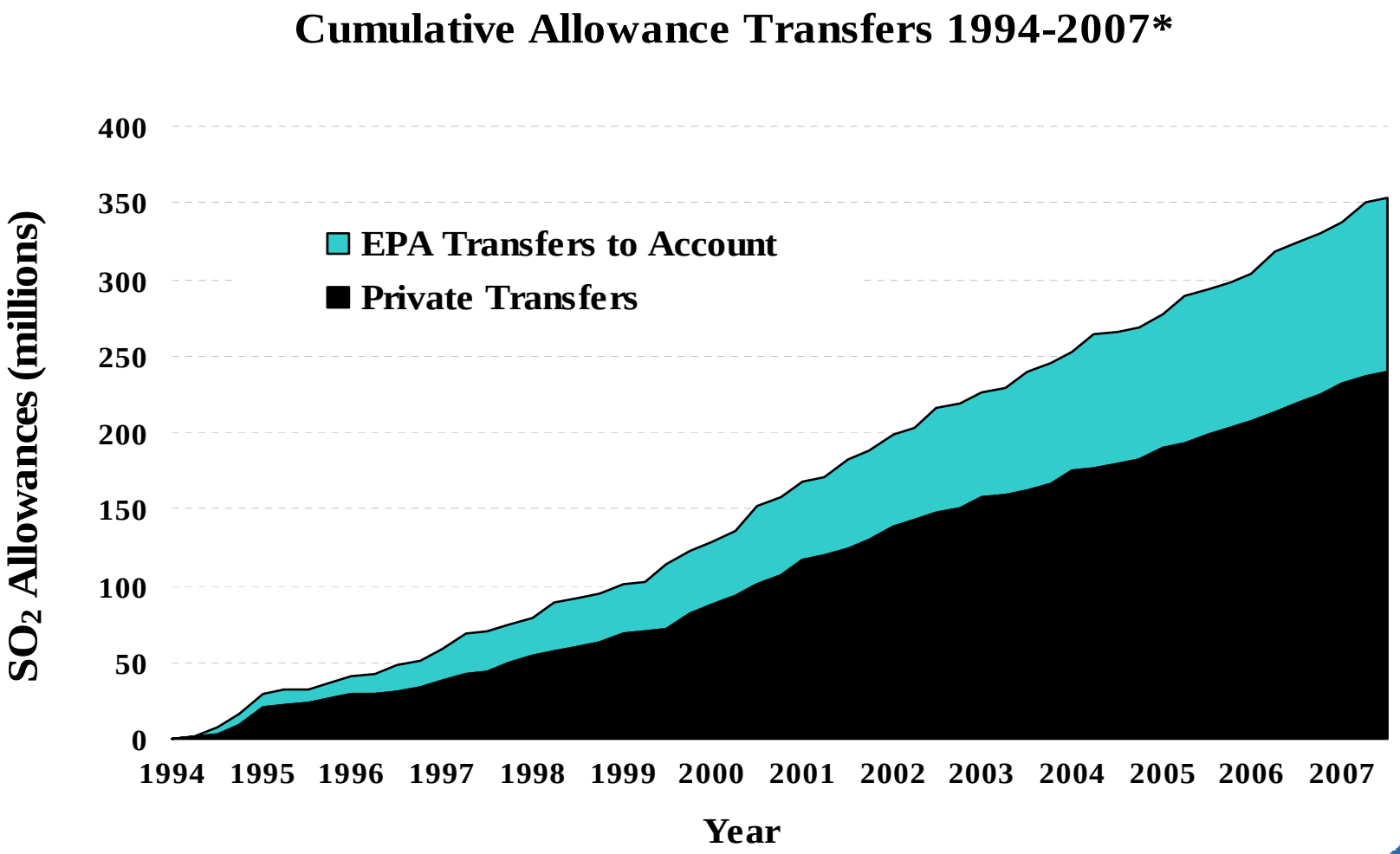


*Note: 2007 data includes all private allowance transfers from 1/1/2007 through 9/30/07. Classification not available

CLEAN AIR MARKET PROGRAMS

Historic Cumulative SO_2 Transfers

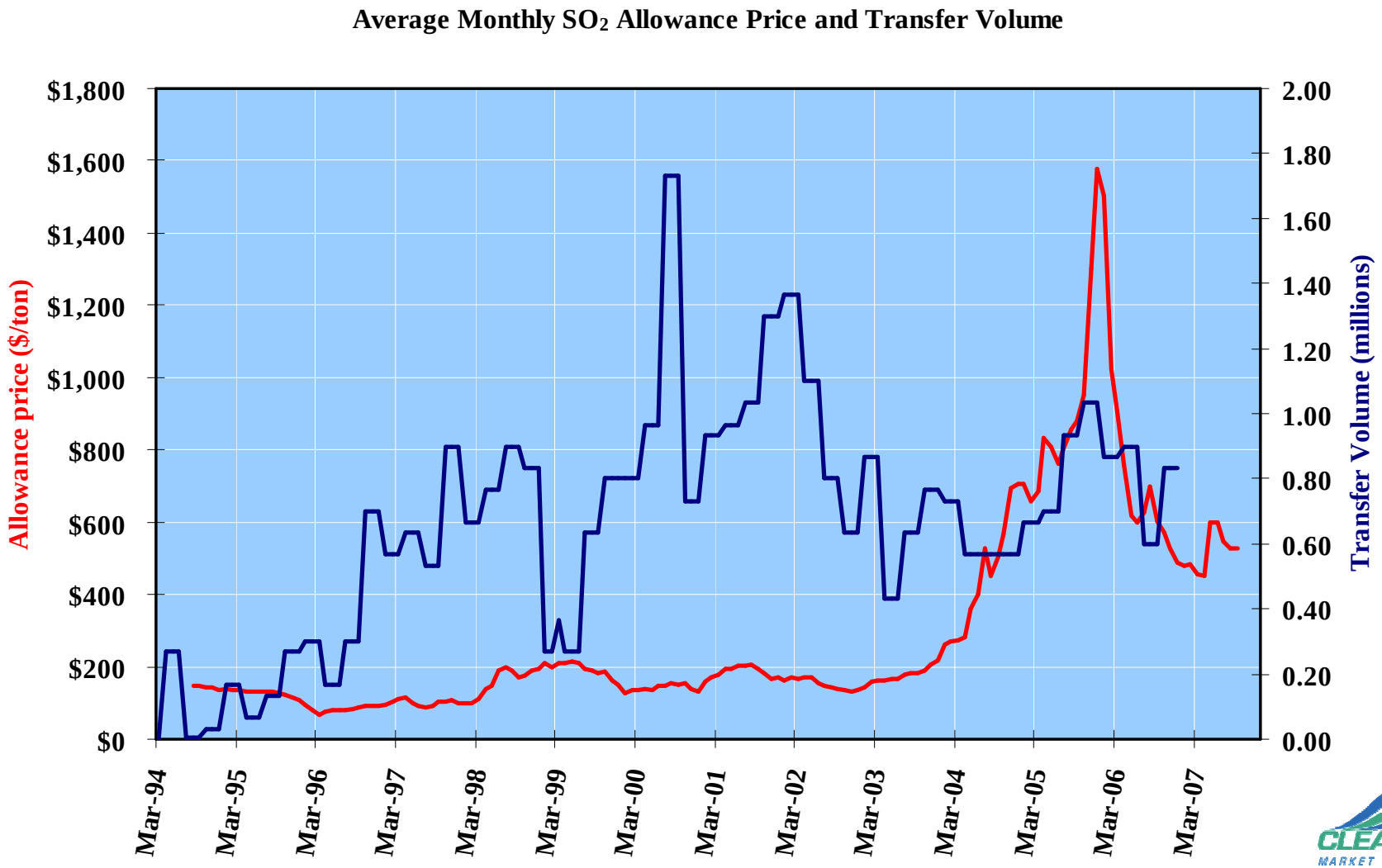
Overall private transfers now top 350 million tons through Q3-07



* Note: Data for 2007 includes tranfers through September 30, 2007.

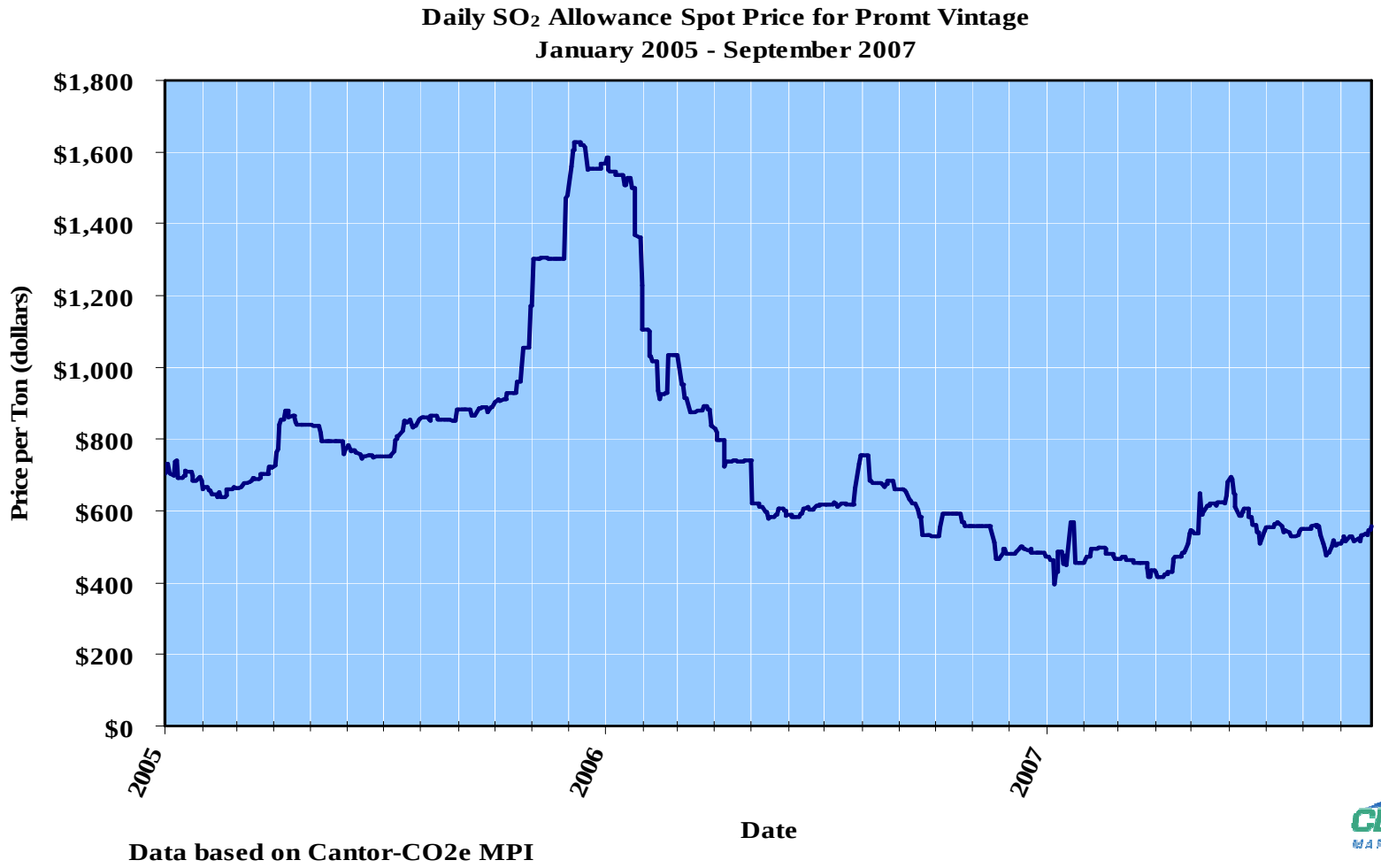
Historical Monthly SO_2 Allowance Prices & Transfer Volume

December 2005 price spike was accompanied by low to moderate transfer volumes



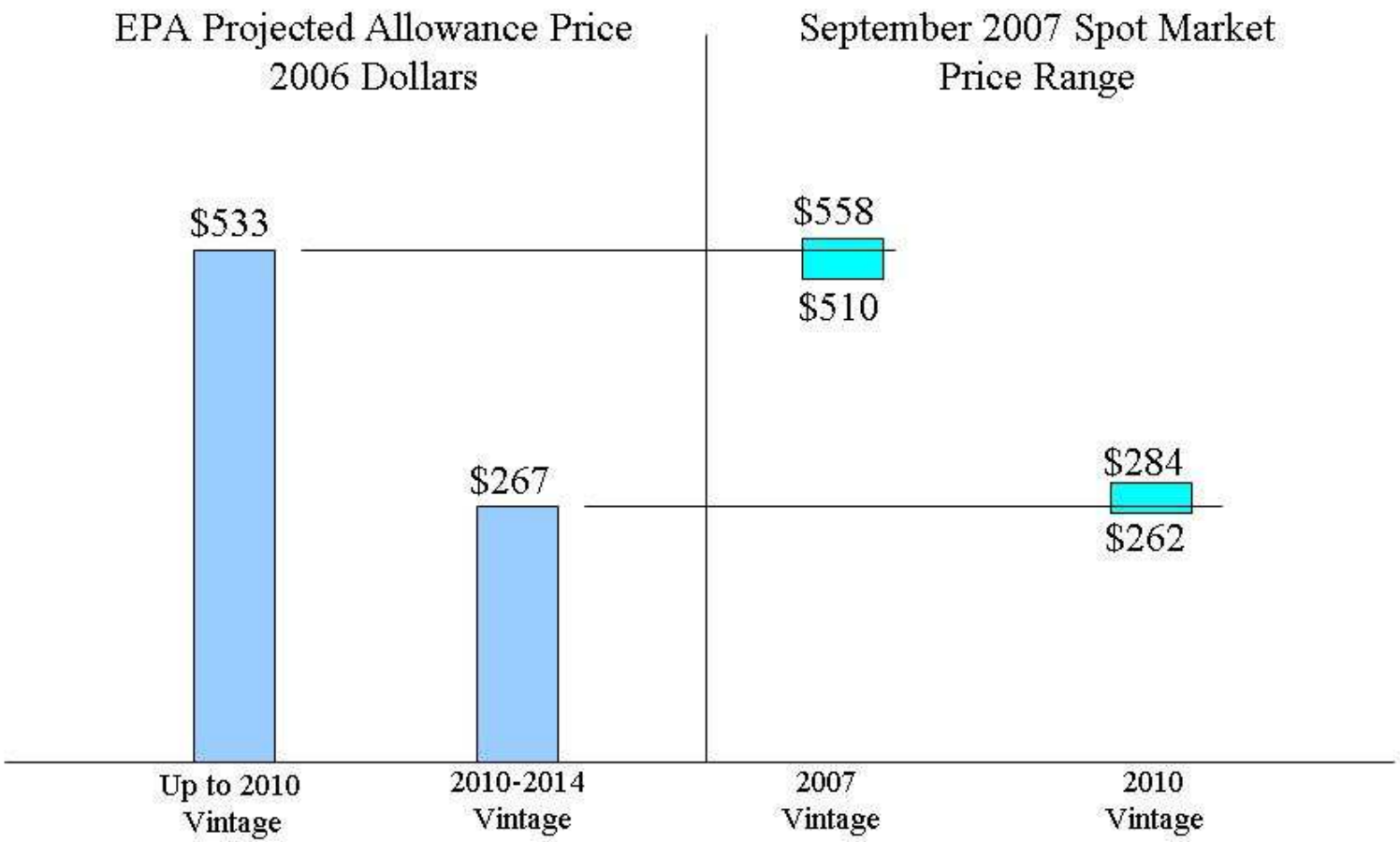
Daily SO_2 Allowance Spot Price

A detailed look at the last 2½ years finds prices are down following the December 2005 price spike and relatively stable



Forecasted & Actual SO_2 Allowance Prices

Current SO_2 market compares favorably to forecast



Sources: Forecasted price, EPA; Spot market prices, CantorCO2e & Evolution Markets

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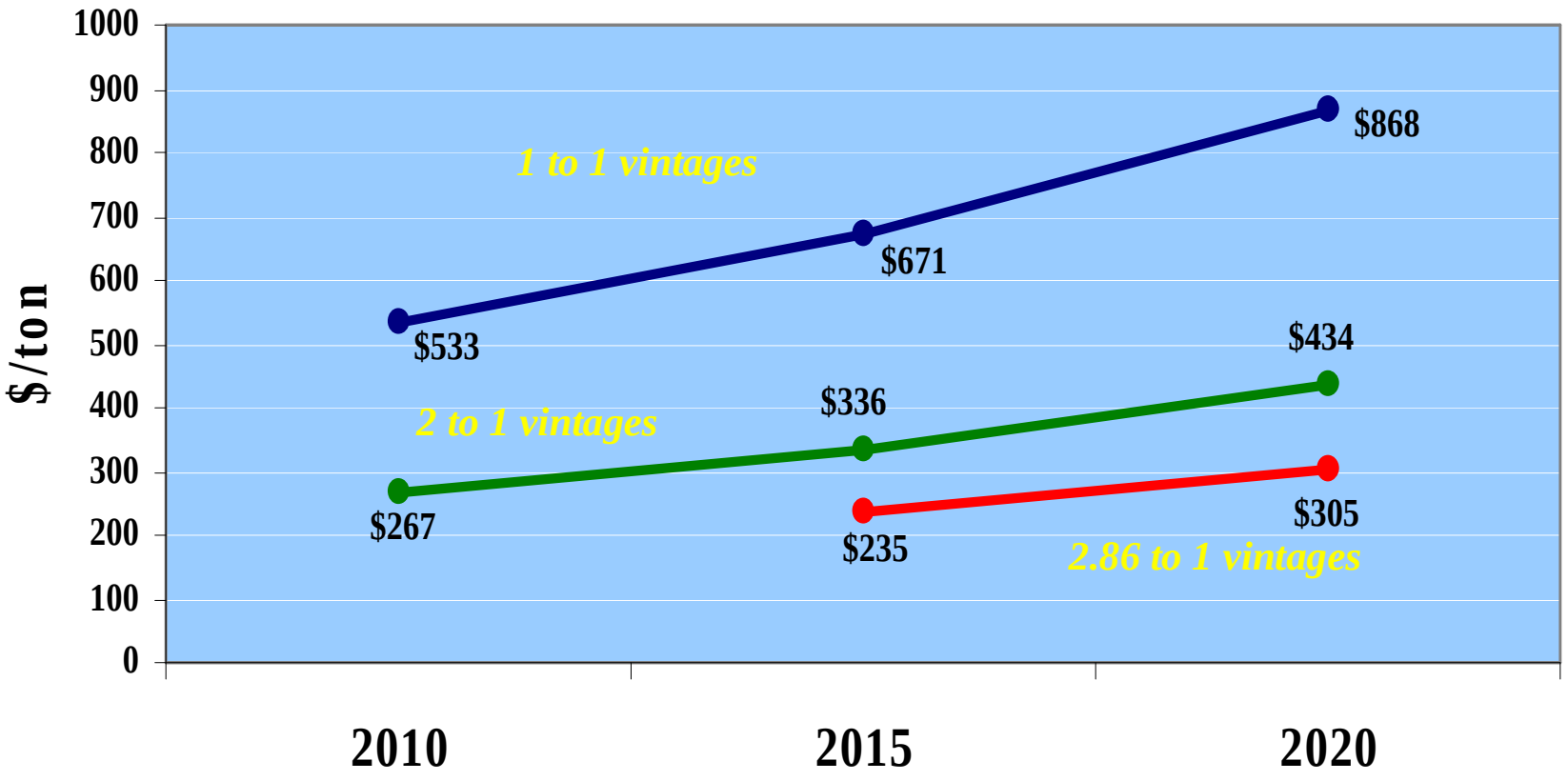
EPA's Forecast of Annual SO_2 Allowance Price



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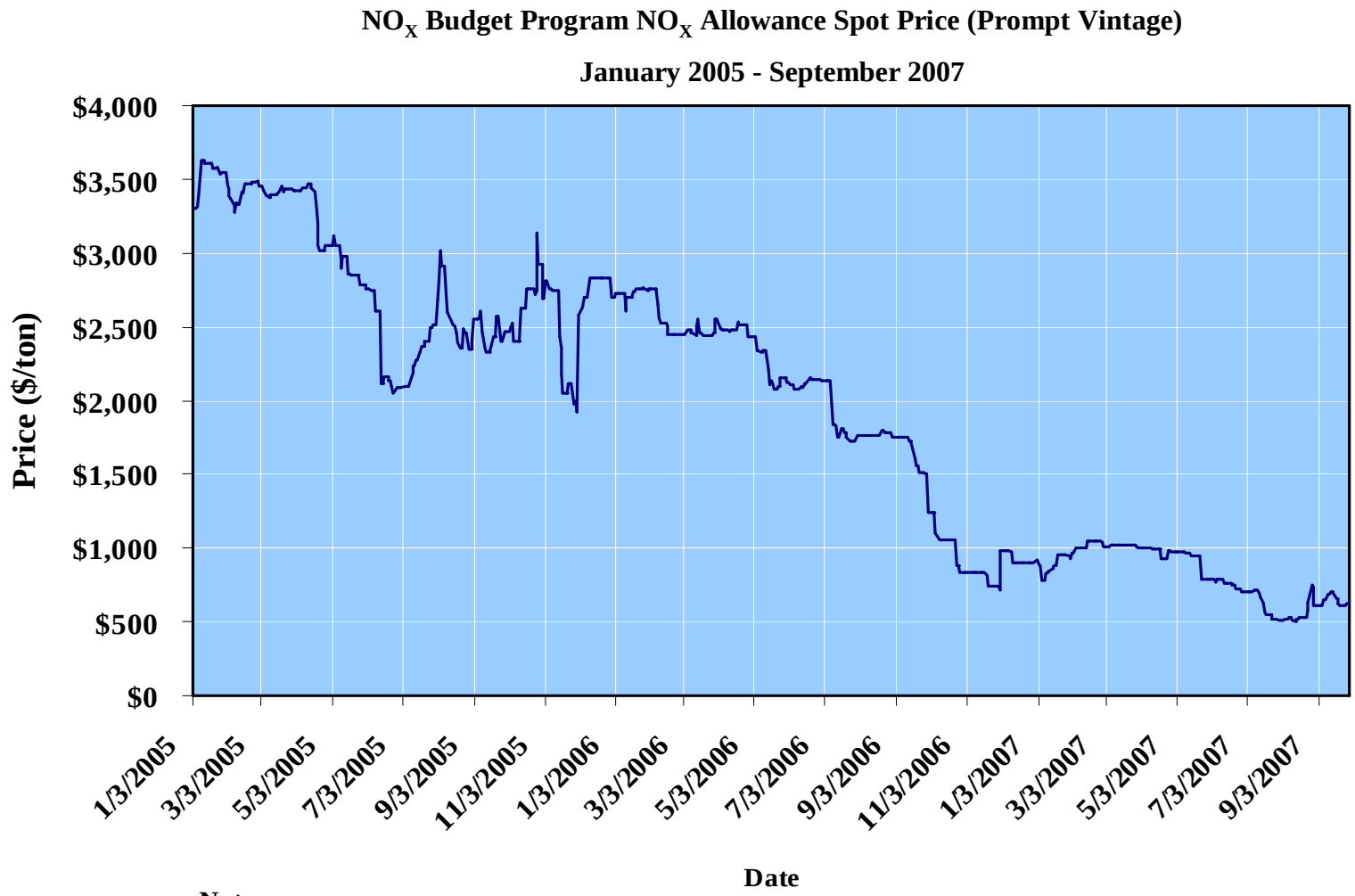
Historical NO_X Allowance Prices (spot)



Notes:

1. **Data Source: CantorCo2e's Market Price Indicator (MPI). See www.emissionstrading.com**
2. **Prompt vintage is the vintage for the "current" compliance year.**

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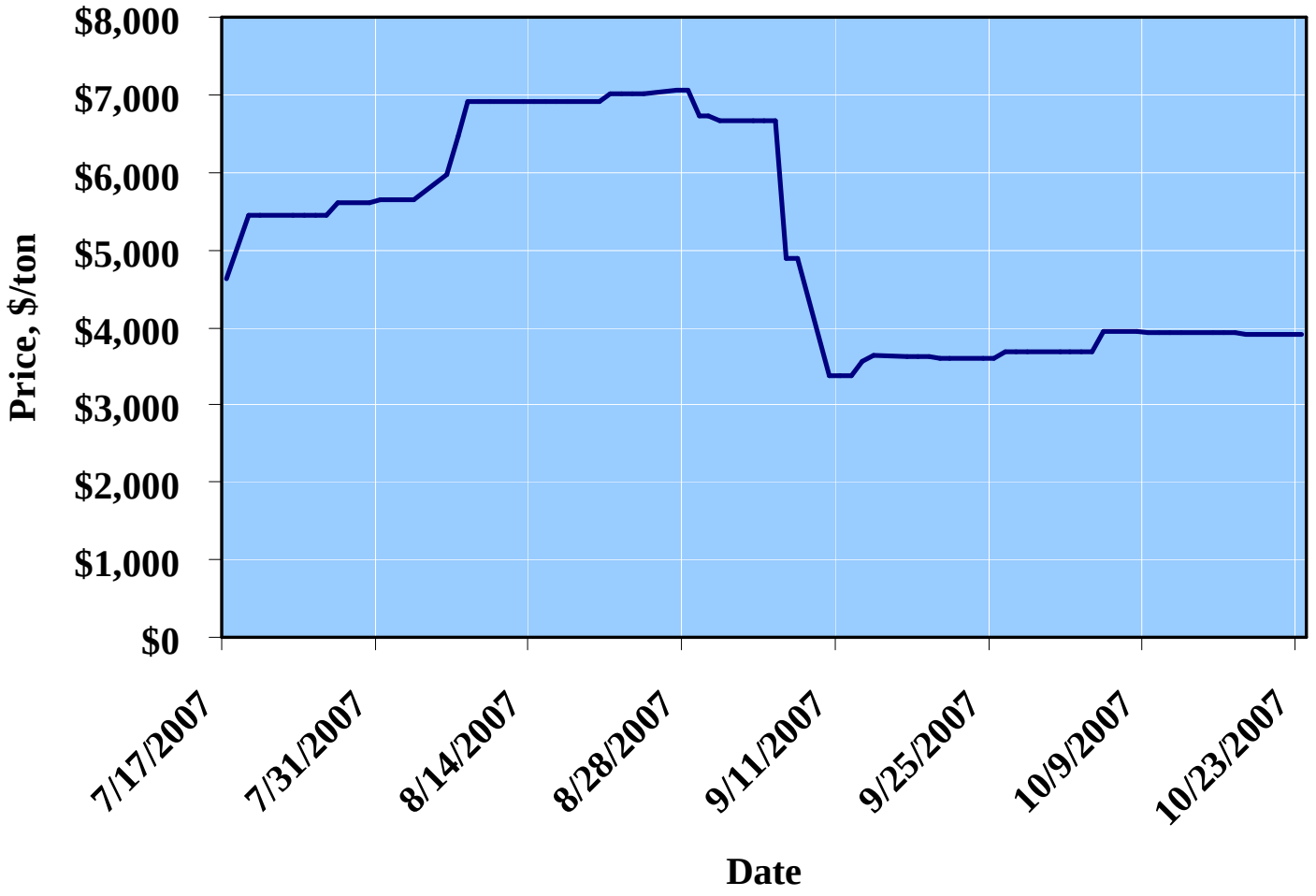
Historical 2009 CAIR NO_X Annual Allowance Prices



Source: CantorCO2e (www.emissionstrading.com)

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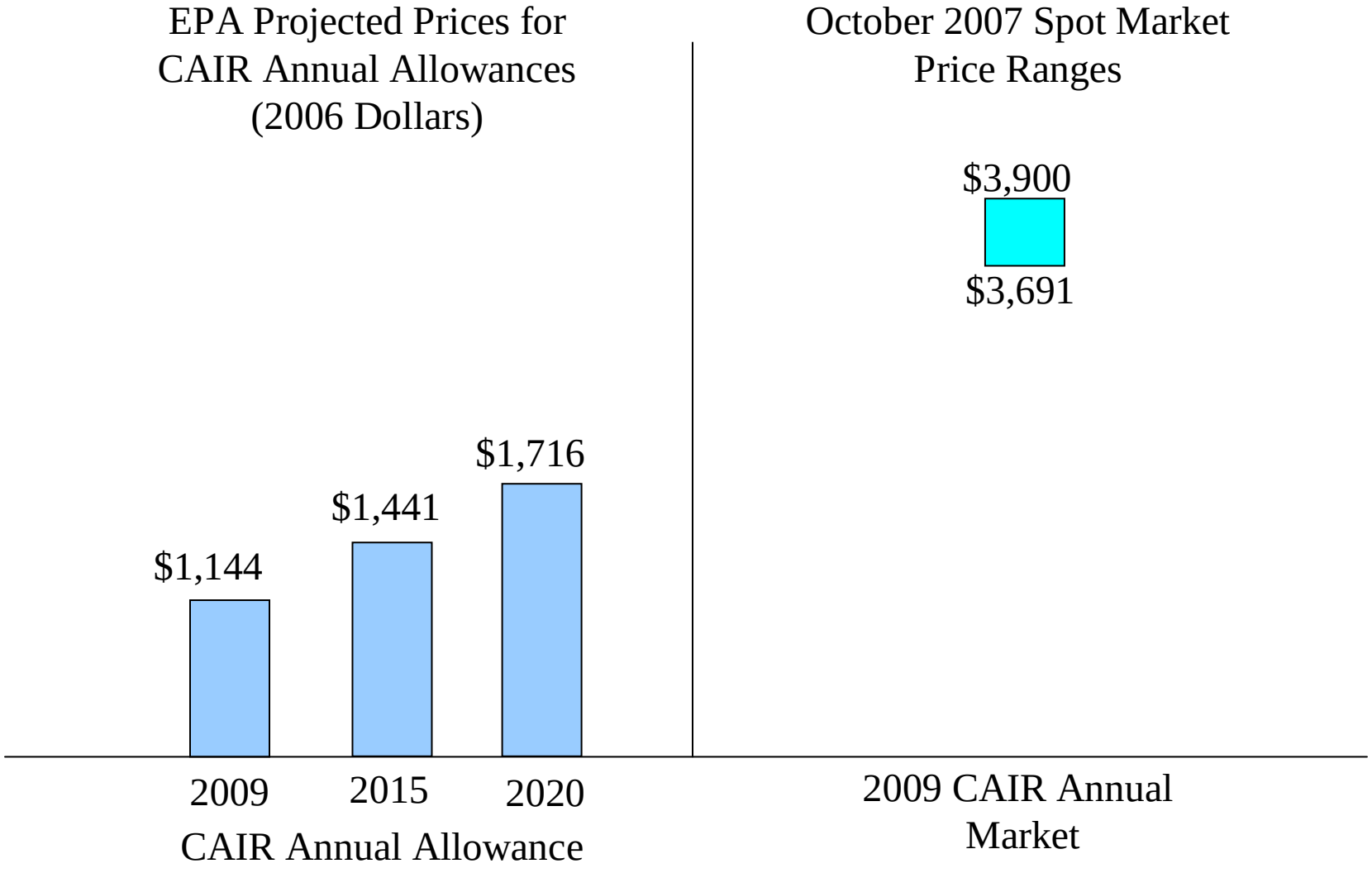
Forecasted & Actual CAIR Annual NO_X Allowance Prices



Sources: Forecasted price, EPA, 2006; Spot market prices, CantorCO2e (10/1-10/23/2007).

CAIR Annual NO_X Allowance Prices

- **Fundamentals suggest to EPA that prices for 2009 annual NO_X allowance should be between $1,500 to $2,000 per ton**
  - Influenced by recent increases in capital costs
    - Industry reports of capital costs doubling on some projects
    - Labor and materials cost increases and shortages
    - Competition for scarce resources
      - NO_X, SO_2 and mercury programs implemented nationwide
      - Demand from China and elsewhere
- **Current market not driven by cost fundamentals**
  - A 400% capital cost increase would be needed for an SCR installation to approach $3,000 per ton NO_X removal (when compared to current IPM inputs)
  - Risk aversion and lack of trading activity seem to be driving the market today
    - Classic case of too much demand, too little supply
    - Access to allocations may ease this pressure

Recent Market Events

- **EPA market tracking and analysis** of allowance holdings suggests no one dominates the emission trading markets. **FERC** monitors this market and shares EPA's view
- EPA sees effective markets for SO_2 and NO_X allowances, although participants note that relatively **modest changes in the levels of trading volumes tend to cause very noticeable allowance price changes**
  - E.g., new entrants acquiring positions.
- When there are "unanticipated" price movements, the markets work and correct themselves over time
- On **September 17**, **Senator Levin** (D – MI) introduced a bill that could enhance regulation of commodities "from the burning of fossil fuels" including "carbon dioxide and sulfur dioxide"
- On **September 18**, **the Commodities Futures Trading Commission (CFTC)** held a hearing on the potential for enhanced oversight of energy markets, including emission markets
- On **October 24**, the **House Committee on Agriculture**, which oversees the CFTC, held a hearing on oversight of Exempt Commercial Markets (ECMs)

Visit the Clean Air Markets Web Site

- Emissions data
- Allowance transfers
- Information on the acid rain and NO_X trading programs
- Program rules and guidelines
- Studies and reports
- NEW Google maps interface!

Clean Air Markets Division

www.epa.gov/airmarkets

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